Quitchupah Creek Road
Final Environmental Impact Statement
January 2006

ERRATA

March 8, 2006

Errata: Replace **Section 3.7 Threatened, Endangered, and Sensitive Species** (pg. 3-56 to 3-69) in its entirety with the following, attached pages:

3.7 Threatened, Endangered, and Sensitive Species

The area of analysis for special status species encompasses the Project Area. As required by the Endangered Species Act (ESA), a Biological Assessment (BA) has been prepared under separate cover and is on file at the Fishlake National Forest Office and the BLM Richfield Field Office in Richfield, Utah. The BA evaluates the potential effects of a Proposed Action on Federally listed threatened, endangered, proposed and candidate species, and determines whether any such species and habitat are likely to be adversely affected by the action. The species accounts and discussion of potential impacts on these species resulting from the Proposed Action and alternatives, as discussed below, are taken from the BA.

The USFS requires a Biological Evaluation (BE) for the assessment/summary of the effects of a Proposed Action on USFS Sensitive Species. The information presented below has been utilized by the USFS for preparing a BE of the Proposed Action and alternatives.

In the case of species which occur or may occur in the Project Area, and species which may be directly or indirectly affected by the Proposed Action or alternatives, a further evaluation of potential impacts was prepared.

THREATENED, ENDANGERED, AND CANDIDATE SPECIES

A total of 10 Federally protected plant and animal species and one candidate species were listed by the USFWS as having the potential to occur within Emery and Sevier Counties and are shown in **Table 3.7-1**. The following discussion evaluates the likelihood for these species to occur in the area, based on habitats present, known occurrences, and the results of dedicated surveys for these species. If a species is known to occur in the area or has the potential to occur, the potential impacts resulting from the Project on that species are discussed.

A literature search reviewed the preferred habitats, elevational ranges, and occurrence records for each of these species. Based upon this information, a determination was made regarding the potential for each species to occur within the Project Area or to be directly or indirectly affected by the Proposed Action or alternatives (i.e. for the species to occur within the Action Area). The

basis for these determinations is presented in the following discussion. In the case of species that clearly do not occur in the Project Area and have no potential to be directly or indirectly impacted by the Proposed Action or alternatives (e.g. plant species occurring only at high elevations), a "No Effect" determination was made.

In the case of species that occur or may occur in the Project Area and species that may be directly or indirectly affected by the Proposed Action or alternatives, a further evaluation of potential impacts was prepared.

Table 3.7-1 Federally Listed and Candidate Species Potentially Occurring within the Project Area

Common Name	Specific Name	Federal Status
Jones Cycladenia	*Cycladenis humilis* var. *jonesii*	Threatened
Maquire Daisy	*Erigeron maguirei*	Threatened
Last Chance Townsendia	*Townsendia aprica*	Threatened
Barneby Reed-Mustard	*Schoenocrambe barnebyi*	Endangered
San Rafael Cactus (Despain Footcactus)	*Pediocactus despainii*	Endangered
Winkler Cactus (Winkler Footcactus)	*Pediocactus winkleri*	Threatened
Wright Fishhook Cactus	*Sclerocactus wrightae*	Endangered
Heliotrope Milkvetch	*Astragalus montii*	Threatened
Bald Eagle	*Haliaeetus leucocephalus*	Threatened
Mexican Spotted Owl	*Strix occidentalis lucida*	Threatened
Western Yellow-billed Cuckoo	*Coccyzus americanus occidentalis*	Candidate

THREATENED AND ENDANGERED PLANTS

Several of the listed plant species which have the potential to occur in the Project Area are restricted to, or most commonly occur on, particular soil or geological formation types. Soils in the area are generally derived by deposits of Quaternary alluvium and gravel deposits. The Project Area cuts through numerous sedimentary geologic formations that include the Mesaverde Group and the Mancos Shale.

The following Federally Listed plant species would not be expected to occur in the project area due to lack of necessary soil types or geologic formations within the project area, or the elevation range of the species is outside that of the project area (Biological Assessment, 2005):

- **Jones Cycladenia (*Cycladenia humilis* var. *jonesii*) - Threatened**

- **Maguire Daisy (*Erigeron maguirei*) – Threatened**
- **Barneby Reed-Mustard (*Schoenocrambe barnebyi*) – Endangered**
- **Wright Fishhook Cactus (*Sclerocactus wrightae*) - Endangered**
- **Heliotrope Milkvetch (*Astragalus montii*) - Threatened**

Three Threatened or Endangered plant species are known to occur or have the potential to occur in the project area. Implementation of the Proposed Action or one of the Action Alternatives would result in a May Affect – Not Likely to Adversely Effect determination for the species listed below.

Last Chance Townsendia (*Townsendia aprica*) - Threatened
This species grows in salt desert shrub and pinyon-juniper habitats on clay or clay-silt exposures of the Arapien and the Blue Gate member of the Mancos Shale, at elevations between 6,100 to 8,000 feet (Welsh et al., 1987; Atwood et al., 1991). Flowering occurs in April and May. This species is known from locations near the Project Area (Section 13 of Township 22 South, Range 5 East) and habitat exists in portions of the project corridor. Field surveys in May 1999 and May 2003, however, did not find any occurrence of this species within the project corridor.

San Rafael Cactus (*Pediocactus despainii*) – Endangered
This species is generally solitary, though it may occur in colonies. Habitat for this cactus is open pinyon-juniper communities on limestone gravels, at an elevation of approximately 6,000 to 6,200 feet (Welsh et al., 1987; Atwood et al., 1991). Flowering occurs from late April to early May. The species occurs at elevations within those found in the Project Area (6,000 to 6,200 feet compared to 6,000 to 7,600 feet in the Project Area). Conversations with the Botanist for the BLM's Richfield Field Office, indicate that this species has the potential to occur within the Project Area (Armstrong, personal communication June 15, 1999); however, none were located during a May 1999 field visit.

Winkler Cactus (*Pediocactus winkleri*) – Threatened
This diminutive species, also known as the Winkler footcactus, is usually solitary. The species occurs in salt desert shrub communities at 4,800 to 5,200 feet AMSL, in fine textured, poor-quality saline substrates (Welsh et al., 1987). Flowering occurs in late March to mid-May. The Winkler cactus generally occurs at elevations below that found in the Project Area. Although this species may be found near the lower boundary of the Project Area (Armstrong, personal communication June 15, 1999), none were located during a May 1999 field survey .

THREATENED AND ENDANGERED WILDLIFE
Only three Federally listed wildlife species were identified by the USFWS has having the potential to occur within the Project Area. All three species are birds. They include: the bald eagle, Mexican spotted owl, and western yellow-billed cuckoo. The Mexican spotted owl and the western yellow-billed cuckoo do not occur in the project area due to lack of suitable habitat (Biological Assessment, 2005), and will not be discussed further in this EIS.

Bald Eagle (*Haliaeetus leucocephalus*) - Threatened
The bald eagle is also known as the American eagle, black eagle, fishing eagle, gray eagle, Washington eagle, white-headed eagle, and white-headed sea eagle (Terres, 1980). During their

breeding season, bald eagles are closely associated with water occurring along coasts, lakeshores, or riverbanks, where they feed primarily on fish. Bald eagles typically nest in large trees, primarily cottonwoods (*Populus* sp.) and conifers, although they have also been known to nest on projections or ledges of cliff faces (Call, 1978). Due to the large size of their nests, bald eagles usually build these structures in a tree which is the largest or stoutest in the immediate vicinity (Call, 1978). Two characteristics common to most nesting sites are a clear flight path to at least one side of the nest and excellent visibility, often with an unobstructed view of water. Most nests are in the top third of a living tree, with live foliage above the nest providing shade and protection during poor weather (Green, 1985). Breeding territories, including the nest tree and favored nearby perches, are defended against other eagles. Alternate nests are also common within the territory. Breeding territories are typically 250 to 500 acres in size (Swenson et al., 1986).

No bald eagle nests are known to occur within or in the general vicinity of the Project Area. Most sightings have been made in the Joes Valley Reservoir and Huntington Canyon areas, the closest of which (Joes Valley Reservoir) is approximately 20 miles north of the Project Area (USDA-USFS, 2000). A bald eagle nest has been reported in the vicinity of Castle Dale, approximately 20 miles northeast of the Project Area boundary. No roost sites have been found in the Project Area, and bald eagles are not expected to occur in the area except as transient birds, most commonly occurring in the winter months.

SENSITIVE SPECIES

Each land management agency maintains their own region-specific sensitive species lists. The purpose of the listings for sensitive species is to identify those species in the managed area that are the most vulnerable to population or habitat loss. Typically, the conservation strategies recommend that proposed developments avoid sensitive species and their habitat so as not to render the species potentially threatened or endangered species under the ESA. The sensitive listed species are not afforded protection required under the ESA for Federally listed threatened or endangered species. Based upon agency consultation, it has been determined that the sensitive species shown in **Table 3.7-2** have the potential to occur within the Project Area.

Under Policy Number W2AQ-4, the UDWR also develops and maintains a list of sensitive species. Designated as the Utah Sensitive Species List, it identifies sensitive species as belonging to one of the following defined categories: extinct, extirpated, State-endangered, State-threatened, of special concern, or conservation species.

In addition, the Utah Natural Heritage Program maintains a list of "rare" species. Several of the listed rare species are also land management agency sensitive species and are addressed below. However, those species that are not sensitive are not afforded protection under the ESA or any land management agency conservation strategy and are, therefore, not discussed further.

Table 3.7-2 USFS, BLM, & UDWR State Sensitive Species Potentially Occurring in the Project Area

Common Name	Specific Name
Fishlake National Forest Sensitive Species	
Flammulated owl	*Otus flammeolus*

Common Name	Specific Name
Fishlake National Forest Sensitive Species	
Northern three-toed woodpecker	*Picoides tridactylus*
BLM Richfield Field Office Sensitive Species	
Basalt milkvetch	*Astragalus subcinereus var. basalticus*
Flannelmouth sucker	*Catostomus latipinnis*
Leatherside chub	*Gila copei*
UDWR State Sensitive Species	
Bluehead sucker	*Catostomus discobolus*
Flannelmouth sucker	*Catostomus latipinnis*

FISHLAKE NATIONAL FOREST SENSITIVE SPECIES

Flammulated Owl (*Otus flammeolus*)

This diminutive owl, approximately six inches in length, inhabits the montane coniferous forests of North and Central America, ranging from southern British Columbia to Guatemala (Ryser, 1985). In most areas, this owl occurs in close association with ponderosa pine (*Pinus ponderosa*) and Jeffery pine (*Pinus jefferyi*), though it has been recorded less commonly in other forest types (Johnsgard, 1988). This small and secretive owl is a cavity nester, and thus requires natural or woodpecker-excavated cavities as a component of its habitat. Flammulated owls are almost exclusively insectivorous, preying on small to medium sized moths, beetles, caterpillars, and crickets (Reynolds and Linkhart, 1987; Johnsgard, 1988; Bull et al., 1990). Like most insectivores, but unlike most owls, flammulated owls are migratory (Winter, 1974; Balda et al., 1975; Collins et al., 1986; Gaines, 1988).

Three-toed Woodpecker (*Picoides tridactylus*)

The three-toed woodpecker is a permanent resident of the taiga or circumboreal forests of Eurasia and North America, ranging southward into the continental United States (Ryser, 1985). The species is found in northern coniferous and mixed forest types up to 9,000 feet elevation. Forests containing spruce, grand fir, ponderosa pine, tamarack and lodgepole pine are used. Nests may be found in spruce, tamarack, pine, cedar, and aspen trees. Three-toed woodpeckers forage mainly on dead trees, although they will feed in live trees. About 75 percent of their diet is woodboring insect larvae, mostly beetles, but they also eat moth larvae. Three-toed woodpeckers are major predators of the spruce bark beetle.

Three-toed woodpeckers are known to occur in the general area from dedicated surveys conducted during 1992 through 1996 throughout suitable habitat in adjacent forested areas. Limited habitat occurs within or adjacent to the upper portions of the Project Area.

BLM RICHFIELD FIELD OFFICE SENSITIVE SPECIES

Basalt Milkvetch (*Astragalus subcinereus var. basalticus*)

The Basalt milkvetch is known to occur within pinyon-juniper and ponderosa pine communities between 4,520 to 7,970 feet elevation (Atwood et al., 1991). Because the appropriate habitat and the Mancos Shale formation for this species does occur within the Project Area, preconstruction surveys for this species will be conducted during appropriate flowering times in the spring/summer prior to construction activities in suitable habitat.

UDWR UTAH SENSITIVE SPECIES LIST

The UDWR Utah Sensitive Species List includes several fish species that are endemic to the Colorado River Basin in which the Project Area occurs, or whose known historical range does not exclude the Project Area. These species are: bonytail (*Gila elegans*), Colorado squawfish (*Ptychocheilus lucius*), humpback chub (*Gila cypha*), razorback sucker (*Xyrauchen texanus*), woundfin (*Plagopturus argantissumus*), Lahontan cutthroat trout (*Oncorhynchus clarki henshawi*), roundtail chub (*Gila robusta*), leatherside chub (*Gila copei*), flannelmouth sucker (*Catostomus latipinnus*), bluehead sucker (*Catostonus discobolus*), Colorado River cutthroat trout (*Oncorhynchus clarki pleuriticus*), Bonneville cutthroat trout (*Oncorhynchus clarki utah*), Virgin spinedace (*Lepidomeda mollispinis*), and least chub (*Iotichthys phlegethontis*). The flannelmouth sucker and leatherside chub are also on the BLM sensitive species list. The bluehead sucker and flannelmouth sucker are covered under a Range-Wide Conservation Agreement (UDWR, 2004) under which several western states have agreed to work cooperatively on conservations measures to ensure the persistence of these species.

As discussed in more detail in the Final Aquatic Resources Technical Report (JBR, 2001c), two of these listed fish species were found in Quitchupah Creek during July 1999 fish sampling. At one out of five total locations that were electroshocked, 13 individual flannelmouth suckers and one leatherside chub were captured. At the other four locations, these species were absent. During 2004 surveys, flannelmouth suckers were determined as 'not present' in Quitchupah Creek (UDWR, 2005a). None of the other fish species on the Utah Sensitive Species List were found during the fish sampling. However, the bluehead sucker was found during a separate survey by UDWR at the confluence of Quitchupah Creek with Ivie Creek.

Potential Impacts To Threatened, Endangered, And Sensitive Species

The Environmental Consequences of each Alternative, in regard to TES species, are discussed below. First, regulatory consequences are described and then potential impacts to the resource itself.

REGULATORY

The BA has been reviewed and approved by the USFWS (**Appendix F**). A Biological Opinion was not required as the determination was that none of the threatened or endangered plant or animal species or habitat would be impacted or adversely affected by the proposed project. Similar review and approval of the BE by the USFS was conducted. Appropriate environmental measures as outlined in Chapter 2 and monitoring as detailed in Monitoring Plan would be implemented if sensitive species might be impacted by the proposed project.

POTENTIAL IMPACTS TO SPECIAL STATUS SPECIES

This assessment evaluates the potential for each Special Status Species to be directly or indirectly impacted by the Alternatives. This assessment is based on a review of the species' preferred habitats and their recorded occurrence. Based upon this information, a determination

can be made regarding the potential for each species to be directly or indirectly affected by the Alternatives.

In the case of species that clearly do not occur in the Project Area and have no potential to be directly or indirectly impacted by the Alternatives (plant species occurring at elevations outside that of the Project Area, for example), a "No Effect" (in the case of listed species) or "No Impact" (in the case of Sensitive Species) determination was made. In the case of species that occur or may occur in the Project Area and which may be directly or indirectly affected by the Alternatives, a further evaluation of potential impacts was prepared.

NO ACTION ALTERNATIVE - ALTERNATIVE A

Selection of the No Action Alternative would not result in any direct, indirect, or cumulative impacts to Federally listed or sensitive species occurring in the Project Area. The road would not be constructed in the Quitchupah Creek drainage or the Water Hollow Benches area, and thus related disturbances would not occur in those areas. The existing land uses and environment in the Quitchupah Creek drainage would continue for the near future.

QUITCHUPAH CREEK ROAD ALIGNMENT - ALTERNATIVE B

Threatened, Endangered, and Candidate Species

Table 3.7-3, developed from the BA, summarizes the occurrence and effects analysis for threatened, endangered, and candidate species potentially occurring in the Project Area. This table includes the rationale for the determinations shown.

Last Chance Townsendia - Threatened is known to occur near the project area and habitat exists in portions of the project area; however, field surveys in 1999 and 2003 did not find any occurrence of this species within the project area. Implementation of Alternative B would have a May Affect – Not Likely to Adversely Affect impact on last chance townsendia.

San Rafael Cactus - Endangered is found at elevations within those found in the project area and has potential to occur in the project area; however during a field visit, none were located. Potential habitat is within the project area but no plants have been located. Implementation of any of the action Alternatives (B, C, & D) would have a May Affect – Not Likely to Adversely Affect impact on San Rafael cactus.

Winkler Cactus – Threatened may be found at the lower boundary of the project area, a field survey confirmed that none were located in the project area. Potential habitat is within the project area but no plants have been located. Implementation of any of the action Alternatives (B, C, & D) would have a May Affect – Not Likely to Adversely Affect impact on Winkler cactus.

Bald Eagles - Threatened that winter near the project area may utilize the roadway for the scavenging of big game road kill. This would lead to potential collisions of bald eagles with coal trucks. As outlined the Applicant-Committed Environmental Protection Measures in Section 2.2, all animal carcasses would be removed daily from the roadway to minimize the potential of bald eagle collisions with coal trucks. Implementation of any of the action Alternatives (B, C, & D) would have a May Affect – Not Likely to Adversely Affect impact on bald eagles.

Sensitive Species

Table 3.7-4 summarizes the occurrence and effects analysis for Forest Service Sensitive Species potentially occurring in the Project Area. The table also includes the rationale for the determinations shown.

Limited suitable habitat for the flammulated owl and three-toed woodpecker would be impacted. In addition, approximately 1.0 acre of riparian habitat and .33 acres of wetlands, potential foraging habitat for flammulated owls, would be disturbed during construction and would be replaced though Applicant-Committed Mitigation Measures.

.

Table 3.7-3 Potential Occurrence and Effects Analysis of Federally Listed Species - Summary of BA

Species	ALT A	ALT B	ALT C	ALT D	RATIONALE
Jones Cycladenia	NE	NE	NE	NE	Not known to occur in the Project Area; geologic formations on which this species occurs do not occur in the Project Area.
Maguire Daisy	NE	NE	NE	NE	Not known to occur in the Project Area; geologic formations on which this species occurs do not occur in the Project Area.
Last Chance Townsendia	NE	MA-NLAA	MA-NLAA	NE	Suitable habitat near Project Area, but not discovered during dedicated surveys. No critical habitat has been designated for this species.
Barneby Reed-Mustard	NE	NE	NE	NE	Not known to occur in the Project Area; geologic formations on which this species occurs are not found in the Project Area.
San Rafael Cactus	NE	MA-NLAA	MA-NLAA	MA-NLAA	Potential habitat near Project Area, but not discovered during dedicated surveys. No critical habitat has been designated for this species.
Winkler Cactus	NE	MA-NLAA	MA-NLAA	MA-NLAA	Potential habitat near Project Area, but not discovered during dedicated surveys. No critical habitat has been designated for this species.
Wright Fishhook Cactus	NE	NE	NE	NE	Not known to occur within the Project Area.
Heliotrope Milkvetch	NE	NE	NE	NE	Not known to occur in the Project Area.
Bald Eagle	NE	MA-NLAA	MA-NLAA	MA-NLAA	Does not make regular use of the Project Area; construction impacts would not alter the limited use. Animal carcasses would be removed daily from the roadway but still may attract foraging eagles. No critical habitat has been designated for this species.
Mexican Spotted Owl	NE	NE	NE	NE	Potential suitable habitat near Project Area, but none were discovered during 2002 dedicated surveys.
Yellow-billed Cuckoo	NE	NE	NE	NE	Does not occur in Project Area.

NE = No Effect
MA-NLAA = May Affect -Not Likely to Adversely Affect
MA-LAA = May Affect -Likely to Adversely Affect
BE = Beneficial Effect

Table 3.7-4 Potential Occurrence and Effects Analysis of Forest Service Sensitive Species - Summary of BE

Species	ALT A	ALT B	ALT C	ALT D	RATIONALE
Barneby Woody Aster	NI	NI	NI	NI	Not known to occur in the Project Area; suitable habitat not present.
Bicknell Milkvetch	NI	NI	NI	NI	Not known to occur in the Project Area; suitable habitat not present.
Tushar Paintbrush	NI	NI	NI	NI	Not known to occur in the Project Area; suitable habitat not present.
Pinnate Spring-Parsley	NI	NI	NI	NI	Not known to occur in the Project Area; suitable habitat not present.
Creeping Draba	NI	NI	NI	NI	Not known to occur in the Project Area; suitable habitat not present.
Nevada Willowherb	NI	NI	NI	NI	Not known to occur in the Project Area; suitable habitat not present.
Elsinore Buckwheat	NI	NI	NI	NI	Not known to occur in the Project Area; suitable habitat not present.
Rabbit Valley Gilia	NI	NI	NI	NI	Not known to occur in the Project Area; suitable habitat not present.
Fishlake Naiad	NI	NI	NI	NI	Not known to occur in the Project Area; suitable habitat not present.
Little Penstemon	NI	NI	NI	NI	Not known to occur in the Project Area; suitable habitat not present.
Ward Beardtongue	NI	NI	NI	NI	Not known to occur in the Project Area; suitable habitat not present.
Arizona Willow	NI	NI	NI	NI	Not known to occur in the Project Area; suitable habitat not present.
Beaver Mountian Groundsel	NI	NI	NI	NI	Not known to occur in the Project Area; suitable habitat not present.
Maguire Campion	NI	NI	NI	NI	Not known to occur in the Project Area; suitable habitat not present.
Bicknell Thelesperma	NI	NI	NI	NI	Not known to occur in the Project Area; suitable habitat not present.
Sevier Townsendia	NI	NI	NI	NI	Not known to occur in the Project Area; suitable habitat not present.
Pygmy Rabbit	NI	NI	NI	NI	Not recorded in Project Area, suitable habitat not present.
Townsend's Big-eared Bat	NI	NI	NI	NI	Not recorded in Project Area, suitable habitat not present.
Spotted Bat	NI	NI	NI	NI	Not recorded in Project Area, suitable habitat not present.

Peregrine Falcon	NI	NI	NI	NI	Known eyrie in Link Canyon area, approximately 5 miles to the north, not recorded in Project Area.
Northern Goshawk	NI	NI	NI	NI	Not recorded in Project Area, suitable habitat not present.
Flammulated Owl	NI	MIIH	MIIH	MIIH	Limited available habitat in area, foraging areas could be impacted.
Northern Three-toed Woodpecker	NI	MIIH	MIIH	MIIH	Known to occur in general area, available habitat could be impacted.
Greater Sage Grouse	NI	NI	NI	NI	Not recorded in Project Area, suitable habitat not present.
Colorado Cutthroat Trout	NI	NI	NI	NI	Does not occur in Project Area; historic range includes North Fork.
Bonneville Cutthroat Trout	NI	NI	NI	NI	Not recorded in Project Area, suitable habitat not present.

NI = No Impact **BI** = Beneficial Impact
MIIH = May Impact Individuals or Habitat, But Will Not Likely Contribute to a Trend Towards Federal Listing or of Viability to the Population or Species
WIFV = Will Impact Individuals or Habitat with a Consequence such that the Action May Contribute to a Trend Toward Federal Listing or Loss of Viability to the Population or Species

ALTERNATE JUNCTION WITH SR-10 AND ALTERNATE DESIGN - ALTERNATIVE C
Similar impacts to Federally listed and sensitive species would occur as described for Alternative B.

WATER HOLLOW ALTERNATE ALIGNMENT - ALTERNATIVE D
Similar impacts to Federally listed and sensitive species would occur as described for Alternative B. There would be a No Effect impact to last chance townsendia (threatened plant species) under Alternative D.

MITIGATION AND MONITORING FOR BUILD ALTERNATIVES
As outlined in the Applicant Committed Measures in Chapter 2, the haul route would be patrolled daily, during daylight hours, to pick up and dispose of all animal carcasses (wild and domestic, large and small) in order to keep the road surface clear. This would reduce scavenging on the road surface by raptors and vultures.

Mitigation for the creation and enhancement of wetlands and riparian zones described in Section 2.2 would be identical for all Alternatives, and in the case of wetlands would provide additional habitat for wildlife. The applicant-committed environmental protection measure of eliminating livestock grazing on 4.7 miles of stream would help restore the degraded riparian zone, providing additional quality habitat for wildlife.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES AND RESIDUAL ADVERSE IMPACTS
No irreversible commitment of habitats for TES species are anticipated to occur as a result of the Alternatives. An increase in noise levels and human activity would occur within the Alternatives area as a result of vehicle travel. No residual adverse impacts were identified for TES species within the Alternatives area.

CUMULATIVE EFFECTS
Past range improvements, such as the reservoir on Saleratus Bench, has provided a water source that benefits certain TES species. Increased public access would occur as a result of the Alternatives, which would increase noise and also disturbance to TES species' habitat. Increased hunting could occur as a result of increased public access. Reasonably foreseeable activities could include federal oil and gas lease exploration and drilling. Reclamation would occur on drilling sites that do not enter into production. A producing gas field would require additional roads increasing access to lands within the watershed.

The removal of livestock grazing on 4.7 miles of stream corridor would protect the riparian plant community allowing it to reach its full potential along this stretch of Quitchupah Creek.